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A Review of some of the Recent Work on the Diagnosis, Prevention and Treatment of Diphtheria*

By J. G. FITZGERALD, M.D., F.R.S.C.

Professor of Hygiene and Preventive Medicine, Director, Connaught Laboratories, University of Toronto

I HAVE, at the commencement of this survey, to thank you for the honour you have done me in extending the invitation to deliver the Mary Scott Newbold Lecture of the College of Physicians of Philadelphia. The subject chosen on this occasion is still one of very considerable interest from the standpoint both of the public health administrator and of the research worker. For the former there is still the uncompleted task of prevention and control and for the latter the opportunity of resolving some of the fundamental questions which remain unsolved in connection with infection and resistance in the disease diphtheria.

We should pause for a few moments to briefly review some of the important contributions made to the knowledge of this subject beginning with the work of Francis Home, an Edinburgh physician, who in 1765 published a small treatise entitled "An Enquiry into the Nature, Cause and Cure of Croup". This embodied the result of his clinical study of twelve cases of what he believed to be a new or rare disease which he designated "suffocatio stridula". Home accurately described the formation of the false membrane in the larynx and trachea in this disease but he also, at the same time, succeeded in propagating an error, namely, that angina maligna and croup were two distinct diseases. In brief, while making an important contribution he also laid the foundation for diagnostic and statistical difficulties which have not been entirely overcome even yet. Samuel Bard of New York in 1771 published his work, "Cause, Nature and Treatment of Suffocative Angina". This memoir embodies some very vivid descriptions of diphtheria. Bard observed 17 cases, among whom there were 7 deaths.

*The Mary Scott Newbold lecture of the College of Physicians of Philadelphia, Delivered April 15th, 1924.

We now come to the first name in the honor-roll of those who have made enduring and substantial contributions to the knowledge of diphtheria, I refer of course to Bretonneau. His observations were made on a large series of cases in the garrison at Tours and elsewhere in the years between 1818-1826. The disease was raging at that time, as it had not done, apparently since the period 1583-1618, when it had caused great ravages in Spain where it was known as "garotillo".

Bretonneau's clinical observations were supplemented by most careful and thorough anatomico-pathological studies. His work, in which were included the first four memoirs, he presented to the Academy of Medicine, ("Traité de la diphthérie. Des inflammations spéciales du tissu muqueux et en particulier, de la diphthérie ou inflammation pelliculaire, connue sous le nom de croup, d'angine maligne, d'angine gangreneuse", etc.) was published in 1826. It had the great merit of being not only a classic as a clinical study, but in it also epidemiological data of great importance, were recorded. The fact that the gums were first attacked in many cases was attributed by Bretonneau to the use in common, of drinking cups. The importance of transfer of infection by such means is now universally recognized. To Bretonneau goes the credit for its first recognition. Bretonneau observed, "I should not express my entire opinion, if I did not add, that I see in this membranous inflammation a specific phlegmasia As it is impossible to apply to a special inflammaton which is so well marked, any one of the improper names which have been given to each of its varieties, let it be permitted me to designate this phlegmasia by the name of Diphthérie, derived from, *διφθῆρα* (pellis, exuvium vestis, coricea)."

Bretonneau wrote, "To prove that croup is only the last degree of malignant Angina, that malignant or Gangrenous Angina is not gangrenous, that there is no relation between sphacelus or supposed superficial mortification and the alterations which this disease leaves behind it, would be a difficult undertaking even for a physician whose opinion would have all the weight due to eminence attained by useful labours. Although in a very different position, it remains for me to accomplish a more delicate task; for I have not only to demonstrate the nature and identity of these affections, but must also show that the ancients had recognized this identity, and that, moreover they had traced the objects presented to them with great fidelity; and that, in a word, they had represented them as they might be seen without the help of pathological anatomy; so that the illusion of distance, which must necessarily have been found in their representations has become for the moderns a source of material errors, and errors the more dangerous because they have been solemnly ratified by the assent of many justly

celebrated men. But the truth has only to exhibit itself in order to surmount these obstacles. From the moment when chance presented it to me, I thought that before publishing my conclusions, it was my duty to direct my attention again to the observation of facts, to review them, to examine them a second time, and to consider them under all their aspects."

"Sixty bodies were opened during the course of the epidemic. Although the examination of certain viscera, which had not presented any sign of morbid alteration during life, was sometimes neglected, the state of the digestive canal and of the air-passages was always studied with the most minute exactness. I endeavoured to prosecute my researches on the bodies of those, who had more particularly presented either the characteristic symptoms of croup or those of malignant Angina, whether the progress of the disease had been left to take its course without any treatment, or had been fruitlessly opposed by the most energetic and most opposite remedies."

"In a great number of subjects I was able to follow the decreasing modifications of the disease up to its perfect cure, which was obtained under the influence of special, general or local treatment. A hundred and thirty soldiers, and twenty individuals of all ages, presented the different gradations acute or chronic, of scorbutic gangrene, confined to the mouth, or extending to the pharynx, and not differing, in the latter case, from Gangrenous Angina."

Bretonneau rightly believed that angina maligna and croup, as well as another manifestation of diphtheritic inflammation, namely, scorbutic gangrene of the gums, were all due to one and the same etiological agent. Bretonneau's clinical and pathological observations are still of extraordinary interest.

Following Bretonneau came his pupil, Trousseau, who proposed that the name of the disease be changed from "diphthérite" to "diphthérie", to indicate that he believed that the disease was a general and not a local one. Bretonneau later accepted the suggestions of Trousseau and adopted the name diphthérie.

Trousseau in an endeavour to ascertain the mode of transmission of the disease, conveyed infectious material, taken from an individual suffering from diphtheria, into his skin and tonsils. He describes this experiment as follows: "It is evident to me that contagion performs the principle part in the propagation of diphthérite still, I wished to perform upon myself a direct experiment with the view of ascertaining the communicative action of the serous secretion which flows in such abundance from the cutaneous surfaces attacked with diphthérite. I accordingly steeped a lancet in a false membrane which I had just ex-

tracted from a diphthêritic wound, and I made one puncture in my left arm, and five or six on the tonsils and the velum palati. I found on my arm at the seat of the puncture, that a vesicle was developed, very similar to that of vaccination; but there was no result upon the mucous membrane. Experiments of a samilar character would require to be repeated; but even if they should not be followed by the development of diphthêrite, it must not be concluded that the disease is not transmissible, but only that inoculation is not the mode of transmission. The same remark applies to rubeola and scarlatina the contagious properties of which are denied by none as far as I am aware". The great merit of this observation lies in the reservation made as to the conclusions which should be drawn from the experiments.

It is certain that to these distinguished French physicians we owe much for their clear and comprehensive clinical pictures, for their altogether admirable pathological studies as well as for the initiation of animal experimentation, in their desire to ascertain the truth in relation to diphtheria. Bretonneau published further studies in 1855 and Trousseau also in that year published a masterly series of clinical lectures.

We now pass from the period of clinical and pathological observations to the era which was ushered in by the first successful attempts to cultivate as Loeffler describes it "diphtheria material on solid culture media". This was in 1880. Between 1840 and 1880 as a result of the increasing conviction of the truth of, and the wider acceptance of the doctrine, that living agents were the cause of contagious diseases; many tentative suggestions were put forward as to the nature of the etiological factor in diphtheria.

While Klebs first succeeded in cultivating bacteria taken from the lesions of patients suffering from diphtheria, and while he undoubtedly did grow on artificial media, among other things *C. diphtheria* (which he described at the Congress at Wiesbaden in 1883) he had not completely succeeded in satisfying the recently formulated postulates of Koch. The latter had, by his fundamental observations on the utility of solid medium, for the isolation of single species through the cultivation of colony cultures, paved the way for Loeffler, who in 1884, by the use of a new culture medium, (solidified blood serum containing nutrient broth) obtained in his first experiment a positive result. On the surface of this new medium there appeared yellowish-white colonies of bacteria which in stained smears were identical in appearance with those he had observed in sections of diphthêritic pseudo-membrane. These investigations were made on 25 cases of diphtheria; from 6 of which *C. diphtheriae* were isolated in pure culture. Loeffler next proceeded by animal inoculation

to establish that the species of bacteria he had isolated produced characteristic lesions in guinea-pigs and rabbits. The fact that the micro-organisms injected into these animals were found only at the point of inoculation and not in the internal organs, suggested to Loeffler that the other lesions observed must have been the result of a poison produced locally but circulating in the blood. He adduced no evidence in favour of this hypothesis at this time however. Indeed he admitted that he had been unable to reproduce the characteristic diphthêritic paralysis in animals. Furthermore cultures of this germ were obtained from the throat of a healthy child; and cultures were not obtained in every case of the disease. For these reasons the etiologic relationship was not regarded as being finally proven by Loeffler himself.

Roux and Yersin in 1888 by entirely new methods and independently of Loeffler proceeded to demonstrate that in broth cultures diphtheria bacilli produced a very potent poison which could be freed from the bacilli by filtering seven day old broth cultures through porcelain filters. These observers were able to produce a poison in broth cultures of *C. diphtheriae* which in germ-free filtrates, produced paralysis in rabbits and pigeons on injection. They made many other fundamental observations on the nature of this poison. Their experiments which proved that paralysis was a constant sequel of *C. diphtheriae* infection in experimental animals, and that germ-free filtrates served as well as broth cultures of these micro-organisms, established with certainty, the etiologic relationship of *C. diphtheriae*, to the disease. Loeffler later, was also able to obtain a similar poison from cultures of *C. diphtheriae*.

Bacteriological studies carried on in all parts of the world soon abundantly confirmed the work of Klebs and Loeffler, and Roux and Yersin. Thus two great forward steps had been taken. Following these important investigations of Roux and Yersin, a number of workers made attempts to immunize animals against diphtheria poison. Loeffler in 1890 reported an interesting experiment in which a guinea-pig injected into the skin with diphtheria bacilli, suffered a severe necrosis; after a brief period a second injection produced a local swelling, in addition however, a severe paralysis. Subsequent injections into this animal produced only a slight degree of local reaction. This indicated that the animal had developed a considerable degree of resistance.

In 1890, Behring and his colleagues began a series of epoch-marking contributions. These culminated in 1892 in his reporting to the 7th International Congress of Hygiene and Demography in London, that by experiments carried out with Wernicke he was "able to demonstrate that the resistance of guinea-pigs against the specific diphtheria poison is in-

creased with their resistance against the living bacilli, and that the blood of highly immunized guinea-pigs possesses outside the body, the power of destroying the diphtheria poison, and further that guinea-pigs can be rendered immune by intra-peritoneal injections of the blood of immunized animals or, if infected can be cured."—The fundamental discovery of diphtheria antitoxin was thus made and its production in large quantities was begun in various laboratories in many countries.

With the communication by Roux in 1894, to the Eighth International Congress of Hygiene and Demography in Buda-Pesth of the remarkable results obtained in the treatment of diphtheria, in collaboration with L. Martin and Chaillou, supplemented by details of the methods of toxin production, immunisation and obtaining serum, the climax of a period of extraordinary productivity was reached. This established serum therapy in diphtheria on a firm basis.

In the same year (1894) a most significant, but infrequently emphasized contribution was made by Abel, and Wassermann independently, when they observed that the blood of many healthy individuals, who have not had diphtheria, possesses the property of protecting guinea-pigs against fatal doses of diphtheria bacilli or toxin. They assumed that bacilli were therefore unable to harm such immune persons because the toxin has no effect upon them. These very important findings may be the explanation of Trousseau's failure to infect himself, and they also shed a flood of light on two or three major points then in dispute in relation to infection and immunity in diphtheria. In the first place it served to explain fully the objection raised in connection with Loeffler's earlier work that *C. diphtheriae* might not be the cause of the disease since it was occasionally found in the throat of healthy persons who had no symptoms of diphtheria. This paradox was explained and a class of healthy carriers was shown to exist. This was emphasized by Wassermann in 1895.

In the second place all subsequent work on natural immunity to diphtheria in man was capable of explanation on this basis. Such immune persons are insusceptible because they possess a certain amount of natural antitoxin. Just why they happen to have this natural antitoxin is another question, which is only in the process of solution at the present time. Roux and Martin in 1894, were the first to observe the presence of diphtheria antitoxin in normal horses. Cobbett (1895) and Bolton (1896) confirmed these observations. This interesting investigation of natural immunity to diphtheria in lower animals, was very fundamental. It has since been demonstrated that natural or normal antitoxin is only found apparently in susceptible animals (man and horse?).

Following the work of Roux and Yersin, Ehrlich began the series of researches on the results of which present knowledge of the structure of diphtheria toxin largely rests. These investigations, carried on between 1894 and 1900, were of profound importance. Their significance is so often blurred in the haze of controversy that certain considerations of great practical importance may be forgotten. Ehrlich first applied in his study of toxins the methods of organic chemistry. Soon he realized that the extraordinary complexity of toxin rendered it necessary for him to adopt the biological method of attack. This resulted in a very short time, in the introduction of certain exact, quantitative conceptions which have been of great value. The so-called, $Lo, L +$ and M.L.D. values were introduced and defined. While it is true that his desire to explain in terms of chemical combination, the various changes that take place in toxin as a result of aging or of the action of physical or chemical agents, or, from the admixture of toxin and antitoxin in varying proportions, led him into what many observers believe were unnecessary complexities, still much of value was achieved. Following Ehrlich and his co-workers, Park and Williams, Arrhenius and Madsen, Salomonsen and Madsen, Madsen and Walbum, Dreyer and Madsen, Brieger and Boer, Morgenroth, Behring, Roux, Danysz, Bordet, Dean and more recently Glenny, Glenny and Südmersen, Ramon and other workers have made important contributions to this subject. In consequence three or four concrete hypotheses as to the mechanism of toxin-antitoxin action, have been formulated. These need only receive mention here. The work of Romer in 1909, of which more will be said later; the recent work of Ramon and finally the introduction of certain additional methods of measuring toxin action (such as the minimal skin-reacting dose, etc.) have perhaps been the most substantial advances made. We are still in ignorance of the exact chemical nature of diphtheria toxin, of the precise changes which it undergoes under various conditions and most important of all, how it produces its most deleterious effects.

The introduction of antitoxin in the treatment of diphtheria at once made evident that some method of determining the therapeutic value of various preparations of antitoxin was essential. Irregularity in results followed the procedure of Behring of injecting living organisms into one area, and antitoxin into another of the same test animal. Ehrlich conceived the idea of mixing the toxin-antitoxin 'in vitro' and subsequently injecting the mixture into guinea-pigs. This was the first step in advance. Various lots of antitoxin were tested, using an aged toxin as the constant factor. Ehrlich soon found that the toxin was not constant, and indeed that both toxin and antitoxin in liquid form were quite unstable.

He learned further that dried diphtheria antitoxin was more satisfactory as a standard than precipitated and dried toxin. In consequence he decided to prepare a dried preparation of antitoxin (which if light and air were excluded would remain constant) which could be used as a standard. He next proposed that the death of the test animal should be the criterion in the determination of potency of antitoxins. His $L +$ value of toxin was set up as the amount of toxin to be used in the determination of antitoxic strength. So it came about that the unit proposed by Ehrlich is the amount of antitoxin which when mixed with an $L +$ dose of a suitable toxin, leaves unneutralized in the mixture, sufficient toxin to cause the death of the test animal within 4 days. The fact that combining as well as toxic elements are contained in the toxin was early recognized.

Without entering into a detailed analysis of the work of Ehrlich, Arrhenius and Madsen or of Bordet, bearing on this; or considering the merits of their respective explanations; it is necessary to recall that toxin modified by certain physical or chemical agents, as well as by the addition of antitoxin, may be made much less toxic while it remains quantitatively unchanged in respect of its combining power with antitoxin. Because of the very complicated and varied terminology used in the papers dealing with this subject, exact definition, at this point, is essential.

In 1901 Madsen and Dreyer using mixtures of toxin-antitoxin in which only "toxone" (in the Ehrlich meaning of the term) was free, succeeded in stimulating antitoxin production. In 1904 Glenny showed that toxin which would not kill guinea-pigs of 250 grams weight in 5 c.c. doses would nevertheless stimulate antitoxin production. Finally in 1909 Arkwright demonstrated that filtered broth cultures of two strains of *C. diphtheriae* which were morphologically and culturally indistinguishable from virulent Klebs-Loeffler bacilli but which possessed no pathogenicity for guinea-pigs and apparently were not toxicogenic, led to the development of antitoxin when injected in large quantities into a horse.

It is necessary at this point to refer to the fact that the method of measuring the therapeutic power of diphtheria antitoxin employed by the French, as a result of the work of Roux and his collaborators, is essentially different from that of Ehrlich. It has been defined as follows: "The preventive strength is said to be 50,000 when 0.01 c.c. of the serum protects a guinea-pig of 500 grammes weight against a dose of diphtheria toxin which kills a control animal of the same weight in 36-40 hours. The relation between the weight of the animal 500 and the quantity of the serum employed is the measure of the preventive strength of the

serum. The serum is injected 12 hours before the toxin. Every guinea-pig which has not lost weight after six days is considered protected. The curative strength of a serum is estimated in a similar manner. In this case the toxin is injected six hours before the serum. The guinea-pigs surviving on the sixth day are considered cured. In place of the toxin the living bacilli may be employed for the tests".

Differences of opinion have continued up to the present, as to the relative merits of the Ehrlich and Roux methods of standardization; the former however, has been adopted practically everywhere except in France, as far as I am aware, and the Ehrlich unit has served as the basis of standard units, since prepared in various other countries.

In connection with the question of standardization of antitoxin and the determination of unitage, it is important to remember that what is really ascertained is simply the toxin-neutralizing power of any antitoxin. Furthermore it is a combined "in vitro" and "in vivo" determination, and the conditions which obtain in the human being under ordinary conditions of infection are naturally very different.

It is not an infrequent experience for those responsible for serum production to receive communications from physicians commenting on the fact that in certain cases of diphtheria a given dose of antitoxin has not had the effect which, from his clinical experience, the physician has anticipated it would have. Unfortunately it is practically impossible as a rule in such instances to ascertain the exact facts at first hand or to undertake investigations, because the reports are received as a rule after the recovery or death of the patient. The significance of these observations in reference to the question of therapeutic efficacy of anti-diphtheritic serum in its relation in turn to toxin neutralizing power is of great interest however, and may have some practical importance. The contention of Roux that, the measure of toxin neutralizing power determined by the present method of standardization of serum has certain inherent limitations, seems to have been substantiated by the work of Cruveilhier in 1905 in Roux's laboratory. This investigator compared sera of different antitoxic strengths obtained both from different horses and from the same horse, as to their preventive and therapeutic action on guinea-pigs into which living cultures of several strains of *C. diphtheriae* were injected subcutaneously.

It was found that more marked therapeutic effects were observed with a serum of lower antitoxic power than with one of higher antitoxic unitage in a majority of the experiments. He concluded as a result of these investigations that "the curative action of a serum does not depend exclusively upon its content of antitoxic unitage". Further "that the

titration of antitoxin as carried out at present does not suffice to render an exact measurement of the efficacy of a serum. This latter property is more exactly determined by what we have designated, the measure of the therapeutic power". Further work is necessary to ascertain whether the conclusions of Cruveilhier can be substantiated and if so, whether they furnish an explanation of such experiences as those just related.

In the splendid monograph on diphtheria by Andrews, Bulloch, Dreyer et al, which has just (March, 1924) been published by the British Medical Research Council, the following opinion is expressed on this question:—

"We have now to consider whether the antitoxin unit is really also a unit of curative power for human diphtheria, as is assumed in the system of measurement for antitoxic power. Experimental work led to the belief that sera containing from 200 to 500 units per cc. all had about the same protective and curative power for guinea-pigs. The clinical administration of sera of various antitoxic strength also gave the impression that the antitoxic power was not the only significant property of the sera. The diametrically opposed school of thought which believed that the healing power of antitoxic serum depends absolutely on antitoxic titre had equally strong supporters". "In view of what has been said we do not consider it justifiable to depart from the orthodox view that a serum depends for its preventive and curative power primarily, upon its antitoxic strength."

In addition to the "in vivo" methods of testing antitoxic properties in antidiphtheritic serum; certain "in vitro" methods of titration of diphtheria and other antitoxins have been proposed by Calmette and Massol (1909), Nicolle, Cesare and Debains (1919), and especially Ramon (1922). These are all essentially flocculation methods. The criterion of toxin-antitoxin neutralization being the appearance of a precipitate at a certain point.

We may now proceed to a consideration of developments which have taken place in the laboratory investigations of *C. diphtheriae*. The observations of Hofmann published in 1888 emphasized the statement made in the previous year by Loeffler that there existed a species of micro-organisms very similar in morphology to true Klebs-Loeffler bacilli and only distinguishable from these latter by their inability to produce harmful effects when injected into guinea-pigs or other experimental animals. This species since known as *C. hofmanni*, was obtained in the nose, throat, and elsewhere, alone and in association with true diphtheria bacilli, in persons recovering from diphtheria as well as in healthy individuals. Loeffler emphasized the necessity of injecting cultures, suspected of being

C. diphtheriae, into guinea-pigs in order to differentiate them from closely related species. Confusion has resulted not only from a great mass of contradictory evidence in regard to *C. hofmanni* but also as a result of the description of a species of diphtheria-like micro-organisms found chiefly in the conjunctivae of persons suffering from Xerosis, which led Kuschbert and Neisser who discovered it in 1884, to describe it as *C. xerosis*.

In the light of present knowledge it can very readily be seen that much unnecessary misunderstanding has arisen as a result of a very simple pit fall, namely the almost universal disregard of the warning issued by Loeffler in 1887 and the attempts made everywhere, by various methods, to distinguish *C. diphtheriae* on the basis of morphology alone or of morphology and staining.

Wesbrook and his colleagues, Wilson, McDaniel and Adair, at the University of Minnesota in 1900 published a morphological study of *C. diphtheriae* and closely related species which not only was much more complete and comprehensive than any previous investigation on this phase of the question, but still serves as a guide for beginners and experienced workers alike. As a preliminary to the study of strains of *C. diphtheriae*, complete and definite knowledge of morphology is essential, and for this purpose the classification proposed by Wesbrook, Wilson and McDaniel is of the very greatest service.

At the outset of his work Loeffler recognized the need of a special staining method for these micro-organisms and introduced his well-known alkaline methylene blue stain. Roux in 1890 suggested a method by which metachromatic granules could be demonstrated. Two or three of these only need be mentioned. In 1897 Neisser described his differential staining method, which while it has a certain value, was one of the reasons why an immense amount of time was spent upon the investigation of morphology. His further claim to be able by this method to differentiate true diphtheria bacilli from diphtheroids was the reverse of helpful. It is probable, as Force has recently pointed out, that this claim of Neisser's was the reason that for many years Loeffler's advice was disregarded and the morphology of unknown cultures, rather than their toxigenic capacity ("virulence") was the characteristic most frequently studied. This tendency was perhaps further exaggerated as a result of the investigation which showed that considerable variations in toxigenic power existed among different strains of *C. diphtheriae*. Finally it was often impossible by the uncertain methods then employed, for workers in laboratories where routine bacteriological examinations were made, to carry out satisfactorily the necessary tests of toxigenic capacity. It must

be emphasized that what was desired was a knowledge of the toxin-producing power (or toxigenic capacity) of the culture and not its invasive power or virulence in the true sense. Hence the administrative control of diphtheria which is based on a bacteriological examination of material from persons believed to be harbouring the causative agent, usually resolved itself into a question simply of morphological identification.

Recent advances in laboratory diagnostic procedures for the recognition of *C. diphtheriae* have been twofold. First there has been a careful re-examination of morphology, tinctorial reactions, cultural features, and biochemical activities on the one hand, and, on the other, a study of immunological reactions and toxigenic capacity.

Biochemical reactions have largely been concerned with a discussion of fermentative activities in carbohydrate media and on this question most contradictory evidence, on certain points, has been published. It has assumed more than academic interest at times, because proposals have been made and, within the past ten years, that final recognition of *C. diphtheriae* might be made on the basis of its activity in carbohydrate media. This is probably not a safe procedure because of the contradictory results obtained in the study of saccharose utilization. It is believed that findings which will be in agreement can be obtained by different workers if two conditions are satisfied, namely, (1) purity of cultures (recent work of Eagleton and Baxter and Fitzgerald and Doyle has emphasized the importance of this factor) and (2) sufficient buffering of the medium. Enlow's medium which has just recently (1923) been described, serves this purpose satisfactorily.

Assuming then pure cultures and sufficient buffer action, *C. diphtheriae* should produce acid in glucose and dextrin but not in saccharose or mannite.

The other aspect of the laboratory investigation of this species is of very great interest and practical importance. It has long been known that in addition to producing a specific toxin, injection into animals of emulsions of diphtheria bacilli results in the production of agglutinins, fixation-antibodies and other immune substances. Nicholas, Lubowski, Lipstein, Schick and Ersttig, Gordon, and more recently, Durand, Mason, Havens, Bell, Christiansen, Park, Williams and Mann, Paxson and Redowitz, Hartley, Scott, Eagleton and Baxter, Fitzgerald and Doyle and others, have explored various aspects of this subject. The one phase of the question which is pertinent at the moment is, simply: "is the agglutination reaction of any assistance in the identification of *C. diphtheriae*?" There are no differences of opinion in regard to certain

points. It has been definitely proven that diphtheria bacilli are readily agglutinable; that their agglutination is highly specific and that by means of the agglutination reaction alone or combined with absorption of agglutinin, it is always possible to differentiate diphtheria bacilli from diphtheroids. It is true that there exist a very considerable number of agglutinative types or groups. The exact number of these is uncertain; there are at least three or four and there may be ten or more. The work of Durand begun in 1918 led a number of investigators to re-examine the question with the result that much information has been obtained during the past three or four years.

Havens in a communication in 1920 claimed that he had obtained evidence which seemed to indicate that two different agglutinative types of *C. diphtheriae* studied by him, produced qualitatively different toxins. This has not been confirmed by subsequent work and it is highly probable that *no qualitative* differences exist between the types of toxin produced by the various agglutinative types of this species; even though there may be very considerable *quantitative* differences in toxigenic capacity and possibly, variation in the rate of toxin production by different strains.

Certain technical difficulties in the preparation of diphtheria agglutinating sera, have been experienced by many workers who have interested themselves in this question. In consequence and also because of the existence of several agglutinative types within the species, the utility of the agglutination reaction has been in question. The following facts recently elicited, have an important bearing on this matter. Scott has shown (1923) that non-toxigenic but otherwise typical strains belong (on serological grounds) to *Corynebacterium diphtheriae*. Of 40 non-toxigenic strains, 13 were identified serologically with groups containing virulent (i.e. toxigenic) bacilli. These 13 strains, (among 265 investigated) were true diphtheria bacilli, identified by means of agglutination, because they were, at least when investigated, non-toxigenic. This is exceedingly interesting, taken in conjunction with another observation of this same worker. One strain which was under observation for a period of more than 18 months lost and regained its toxigenic power. Miss Doyle and I have encountered a strain in our series of cultures which originally was actively toxigenic and agglutinable. It has since almost ceased to produce toxin but continues agglutinable. Scott isolated 5% of non-toxigenic strains from acute cases of diphtheria, and 2% from convalescents. We have studied a number of strains which when tested were non-toxigenic but agglutinable, and were from persons with undoubted diphtheritic infection. These investigations had been made with pure, single colony cultures. It is impossible to declare with certainty

that there was no admixture of types in the colonies studied, but with that reservation, it is reasonable to infer that cultures of *C. diphtheriae* may sometimes be identified by means of the agglutination reaction when toxigenic tests are negative. In other words, agglutination tests with polyvalent sera (or monovalent if necessary) may sometimes be of value in supplying supplementary information not obtainable by means of the toxigenic ("virulence") test in the study of certain strains.

Scott propounds the further question: "could an agglutination test be employed instead of an animal test in the determination of virulence"? (toxigenic capacity). As a result of his study his answer to the question is: "In view of the fact that only two of the group sera included both virulent and non-virulent strains it would appear that a positive result (absorption of agglutinin or high-titre agglutination with a specific serum) with one of the first six group sera might safely be regarded as equivalent to a positive 'virulence' (toxigenic capacity) test".

Independently, Miss Doyle and I have been investigating the same subject. In a preliminary note published before Scott's monograph appeared, using whole field cultures from cases of diphtheria we obtained, by means of the agglutination reaction, results which were in harmony with the findings in smear examinations, in from 75% to 90% of cases. In a number of instances when no characteristic bacilli were seen in smears, positive agglutination tests were obtained and in every such instance, the history obtained indicated that the patient might have been suffering from mild diphtheria. Two monovalent rabbit sera were employed in these tests. Spontaneous agglutination was occasionally encountered. Utilizing an agglutinating serum, prepared by the injection (into a horse) of several types of *C. diphtheriae*, parallel investigation of morphology, "virulence", (toxigenic capacity) and agglutination, was undertaken in a series of 105 mixed field cultures from patients with diphtheria. 92 gave a positive "virulence" (toxigenic) reaction, and 82 a positive agglutination. In another series about 80% gave a positive toxigenic and about 55% positive agglutination. These investigations are being continued to ascertain whether a broadly polyvalent agglutinating serum will give, with whole field cultures or pure cultures, results which will obviate the necessity for a toxigenic ("virulence") test or will supplement the information gained by the use of the latter.

The determination of power to produce toxin as originally proposed by Loeffler involved the use of one or more test animals for every culture investigated. The injection of the culture itself, or a stated amount of the filtrate (in which the strain of micro-organism had been grown) into one guinea-pig, and the same material with the addition of diphtheria

antitoxin into another guinea-pig (as a control). For each toxigenic and protection test two animals were necessary. This was expensive and not always satisfactory. In 1909 Romer made the important observation that the intra-cutaneous injection of a small amount of diphtheria toxin into a guinea-pig produced a characteristic lesion in the skin. Very small quantities of toxin produced a slight oedematous swelling and redness which persisted for three or four days and is followed by a falling of the hair over the inoculated area. With the injection of slightly larger doses of toxin a little necrotic area, following redness and infiltration at the site of inoculation, is observed. This very important contribution has had great significance not only in relation to the determination of the capacity of cultures to produce toxin, but also serves as the basis of methods including the Schick test for the detection of small amounts of antitoxin, and the standardization of toxin-antitoxin. Novotny and Schick in 1910 observed the effects of percutaneous applications of toxin diphtheria, as Pirquet had done with tuberculin. Neisser a little later (1913) employed emulsions of living cultures of *C. diphtheriae* for intracutaneous testing and found that the results obtained were similar to those obtained by subcutaneous injection. In 1916 Zingher and Soletsky modified the procedure of Neisser and recommended the use of two guinea-pigs, one a control animal, into which antitoxin had been injected, (which animal could be used a second time within a week without further administration of antitoxin) and the other test animal. Into both, intracutaneous injections of emulsions of four different cultures were made. By this method four cultures could be tested in 2 animals instead of 8, as in the older method. Smeeton in 1917 compared the intracutaneous and subcutaneous methods for the detection of toxigenic power and concluded that the former was more accurate and also was a saving in time and expense. Eagleton and Baxter in 1921 still further modified the Neisser method by recommending that standard suspensions of emulsions of the cultures be injected, and known positive and control cultures included. They also proposed, that in addition to injecting 500 units of antitoxin into the control animal, the test animal be given 125 units of antitoxin, four or five hours after the intracutaneous injection of the culture suspensions. The use of this so-called "following" dose, suggested by Eagleton and Baxter, saved the life of the animal, if several active toxigenic strains were injected, but did not interfere with the local reaction in the skin.

All the methods so far described required the isolation in pure culture of *C. diphtheriae* from the original whole field culture. Frequently the isolation in pure culture of the strain to be tested from the

field culture, is difficult or impossible. The admixture of many colonies of diphtheroids with relatively few colonies of *C. diphtheriae* may mean that colonies of the latter are not picked and a false negative result is obtained.

Based on some preliminary work of Wayson in 1916 (in which he suggested the injection subcutaneously of whole field cultures and also made a few observations on the results of the intracutaneous injection of the same emulsions), Force and Beattie and Havens and Powell in 1922 described methods of testing whole field cultures by intracutaneous injection. The work of Force and Beattie is quite comprehensive and all the methods previously proposed are considered in detail, and the technique and merits of the method proposed by them, set forth. The results of the investigations of these workers has recently been substantially confirmed by Bull and McKee. It occasionally happens that virulent streptococci when present in field cultures with *C. diphtheriae* may cause the death of both control and test animals. In this event, or if for any other reason, the results are unsatisfactory, when whole field cultures are used, the isolation in pure culture of the organism, and its subsequent testing intracutaneously is necessary.

Within the past month, Fraser and Wigham (March, 1924) have recommended the use of rabbits for the intracutaneous test of whole or pure cultures of *C. diphtheriae* as well as for the testing of minute amounts of toxin-antitoxin. This method makes it possible to test a large number of cultures—24 or more—on the same animal, under comparable conditions. Using known negative and positive controls and a following dose of antitoxin this is perhaps the most satisfactory method so far suggested for testing a large number of cultures, or toxin-antitoxin mixtures, at one time.

It would appear then, that if a strain of *C. diphtheriae* is toxigenic when tested its identification can usually be established with certainty. However, concrete difficulties still present themselves when resort is had only to toxigenic tests. Bull and Havens have just reported (November, 1923) the results of the investigation of 7790 combined nose and throat cultures obtained from school children in Baltimore. Among this large number 338 cultures were considered positive on morphological grounds. Among these 338 cultures, 136 were found, by means of the whole field culture test, to contain toxigenic diphtheria bacilli.

These observers point out however, that "diagnostic films of 102 cultures which proved to be avirulent, contained typical granular forms. Pure strains isolated from 55 of these avirulent cultures had typical morphology and gave typical carbohydrate reactions. These cultures

were apparently devoid of virulence, since massive doses failed to cause characteristic lesions in guinea-pigs". It would appear that these results lend support to the thesis that identification of strains of *C. diphtheriae* which are only weakly (if at all) toxigenic when tested, should be attempted by means of specific serum agglutination.

Continued next issue.

Relative Value of Sex Education

By DR. J. J. HEAGERTY

KNOWLEDGE of sex matters is not a panacea for sex habits, for the formation of such habits. Lack of character, lack of moral ignorance of sex is not the sole nor the most important factor in training, lack of ideals or false ideals play a part co-equal with, if not greater than, lack of knowledge in the formation of sex habits. The habits a child acquires are largely the habits the child will carry through life. "The boy is father to the man." Habits and character are largely the result of imitation of parents and close companions; therefore, the self-evident duty of the parent is to live a clean moral life so as to be ever a shining light to guide the child along life's path.

If the daily life of the home has not taught the advantages of clean moral living, neither precept nor admonition will do it. While character and the development of proper ideals are in great measure the product of the home, there is no doubt that community outlook plays a part of no little importance in their development. If the community outlook upon sex is wholesome and pure, the children will have a wholesome and pure outlook upon sex matters; if gross and impure, the social outlook of the children will be gross and impure.

The development of false ideals and of harmful sex habits are in no small degree the product of evil companionship. That children of tender years acquire sex knowledge and sex habits from older children is well known. Older street companions are to be avoided for such companionship is distinctly harmful. Admonition as an incentive to the development of character and ideals is of little value. Be good because I tell you to be good, is not very effective. Example and supervision by the parent are of paramount importance in the making of clean, moral, upright men and women and nothing can take their place.

Apart from the development of sound character as a basis of self-control, there is need of definite instruction on the simple facts of life and reproduction. Undoubtedly the parents are the rational instructors of the child—the father of the boy and the mother of the girl. All are in accord that instruction should be begun early, sufficiently early to offset the knowledge which is bound to be received from extraneous sources.

Read at Annual Meeting, Canadian Social Hygiene Council, December 10, 1923.

The facts of life should be taught in a simple, clear way without embellishment. Sex should not be unduly stressed and nothing taught which does not bear directly on the subject. Sex instruction should be modified to suit the age of the child. Up to the age of twelve years the boy should be given simple instructions in physical cleanliness. It is more important at this period of life that habits of physical cleanliness of the body as a whole be engendered by the example and admonition of the parent than that the child's attention be focussed on the organs of reproduction. Anything which would tend to make the boy conscious of the sex organs should be avoided. If he asks questions they should be answered as truthfully as possible, but in no case should the answers be purely materialistic. In every case the association of the supernatural with the natural phenomena of life and reproduction should be pointed out.

The second period, from twelve to fourteen years, is the period during which the boy becomes conscious of sex. It is the period during which he receives his first knowledge, of sex from other boys and is apt during this period, to develop sex habits. It is the period of life when new sensations, new knowledge, new experiences come tumbling in one on top of the other with alarming rapidity; the fullest and most difficult period of the boy's existence, when a boy's character may be made or unmade for all time. It is the impressionable period of the boy's life. Proper ideals and a proper outlook on matters of sex may be easily engendered in the mind of the boy by the thoughtful parent. Now, more than at any other time, the boy looks up to his father with respect and admiration and his chivalrous nature may be most easily touched, and ideals of respect for womanhood and motherhood most easily inculcated.

The companionship of the father may be made of life-long value to the boy. In talking to his boy on matters of sex, the father should deal, first, with the physical, and then with the moral aspects, and should never forget that the final object is the building of character and development of ideals. Every talk is a buttress to the stone wall of character.

Of what should the physical instruction consist? It should deal with life and reproduction. The subject should be dealt with broadly. There is nothing to be gained by stressing the anatomy and physiology of the male and female bodies. This should be reserved for a later period of life when such information should be imparted by a physician.

The ideal time for the parent to introduce the subject of life is during rambles together. How easy during an evening stroll together for the father to point out the firmament with its myriad stars, the handiwork of a supernatural power; to digress on the creation of the world and the

origin of life. From the heavens one comes naturally to discuss life as one sees it about one—the vegetable kingdom, the animal kingdom and man. It is not necessary to have a very full knowledge of astronomy nor of vegetable and animal life and their methods of reproduction. All one needs is a broad general knowledge of physical laws and their application to life. An admiration for God's handiwork, or nature's handiwork, if one wishes, is engendered in the mind of the boy. The responsibility of every minute living thing for the success of the whole plan is gently forced upon the mind of the boy and, finally, his own responsibility in the scheme of things. The way in which he has come into the world and the part he plays, together with his responsibilities, naturally follow.

The intelligent boy will look forward to talks of this kind and will welcome them. The wise father will gradually develop these talks in such a way as to bring home to the boy the part he is expected to play in the game of life, his responsibility to his better self, to his womankind and to his country. How easy to impress upon the generous whole-souled boy at this time the chivalry with which he should treat the gentler sex. The example of the father in the home, the consideration he shows to his woman-folk and all women, will create a deep and lasting impression on the boy's mind.

This to some men may appear idealistic and impractical, but if a man will look back on his own boyhood days and consider the source and nature of his information; if he will look back on the struggle during the days of his young manhood when nature demanded recognition and will think a while on his mental and physical struggle as well as the temptations which assailed him, surely he will deem it worth while to try, by whatever means he can, to help his son in that struggle through which he too must pass. We who have gone through that period of life realize how wonderful it is that so many men gain control over their physical self. "*Ad astra per aspera*", is never more true than of the struggle that results in the final control over one's nature. If knowledge is an important aid to self-control, then give it.

Not every father can, not every father will give his boy the necessary knowledge. If the father has not the boy's confidence, and he will not have it if he has made a habit of bawling him out on every occasion, he cannot give the knowledge. Unfortunately there is a wide gulf between father and son in only too many cases. It is quite evident that the number of fathers who talk to their boys on life and its responsibilities is very small, so that it becomes necessary to provide lectures for the talk.

There are few lecturers qualified for the subject. The essentials of a good lecturer are:

1. Unimpeachable character.
2. Personality.
3. Enthusiasm.
4. Knowledge of the subject.
5. Good terminology.

I do not think it advisable to lecture to groups of boys under fifteen years of age on the subject of sex. The mind is not yet ripe for that type of knowledge. In fact, seventeen is the most suitable age for the acquisition of social hygiene information. I have made it a habit to limit the age to fifteen. My experience has been that the high school boy of fifteen years of age has an astonishing amount of knowledge about sex and, on the other hand I have found that the street boy and delinquent boy know very little.

The subject matter of my lecture to boys of fifteen years and over deals with the anatomy, physiology and pathology of the body in its relation to the reproduction of life. I use the American Social Hygiene Association's lecture film for men. In introducing the subject, I point out to my audience the fact that they are there for the purpose of instruction, that a knowledge of the subject of social hygiene is vital and may make the difference between happiness and life-long suffering and regret. I have never failed to obtain a manly response. I never fail to point out the fact that the most wonderful thing we accomplish in the world is the reproduction of life, that all other things are subordinate to this, that the power of reproduction is a divine gift and that in bringing others into the world we are merely accomplishing the divine purpose; we are merely instruments of the divine will.

The noblest parts of the body, therefore, are those parts which have been given us for the reproduction of life and we should treat them accordingly. The part men play in making God's most beautiful creature, woman, an outcast through prostitution is stressed. I find that an appeal to decency, to kindness, to love and sacrifice for others meets with an instant response.

As a result of the many talks I have given boys, I have concluded that the vast majority of boys and young men are desirous of obtaining information of the right kind and from the right source. Their response to an appeal for decency is a compliment to their manhood. The demand for information is enormous and our response has been trifling to say the least. I have had the experience on a number of occasions in Ottawa of having the police turn out to keep order among the crowds of young men

waiting to get into the lecture theatre. I have seen the police pushed aside and the doors broken in by the crowd in their eagerness to get a seat.

The subject matter of our lectures and our methods are, as yet, far from being perfect. We are constantly improving and I hope the day is not far off when every young man of seventeen years will be properly equipped with character and knowledge that will help him to deal successfully with life's problems as they arise.

Comments on the Recent Smallpox Epidemic in Windsor and Vicinity

By DR. R. R. McCLENAHAN

WITH reference to the recent epidemic of smallpox in Windsor, I thought I could not do better than place in your hands the circular recently issued by the Provincial Board of Health and discuss more fully than is done there, certain interesting features of the epidemic.

HISTORY OF THE EPIDEMIC

It is my opinion that there were in Windsor during February and March two types of smallpox of different severity, one a mild type with few cases brought over from Detroit and the other a severe virulent type transmitted because an irregular type of haemorrhagic smallpox was not diagnosed. It was not possible to determine the origin of the latter type. The first case of this type was a furniture mover who had not been to Detroit, and was not known to have been in contact with other smallpox cases. He had been, however, in many houses while carrying on his work and may have been in contact with a concealed or mild case. Two days were spent visiting houses where this man had delivered furniture, but the source of his infection was not discovered. The reason for the severity of the disease in his case and in all his contacts who were unvaccinated may be attributed either to the lack of protection these people had through being unvaccinated or to a more virulent type of infection or (what is more likely) to a combination of the two circumstances. The only other point of interest is that just before the Windsor epidemic there had been a very severe epidemic at Chapeau of very much the same type and it is possible that an irregular form of the disease there may have reached Windsor and so started this severe epidemic.

SEVERITY OF EPIDEMIC AND INFLUENCE OF VACCINATION

The latest figures of the number of cases and deaths due to the original undiagnosed case are:—

	Cases	Deaths
Windsor	34	15
Amherstburg and vicinity	17	10
Maidstone and vicinity	10	5
Detroit	2	2
Total	63	32

Read before Section of Preventive Medicine and Hygiene, Academy of Medicine, Toronto, April 29, 1924.

The following are the figures for each municipality:—

WINDSOR	Cases	Deaths	% Mortality
Never successfully vaccinated	21	15	71%
Vaccinated years before e.g., 12, 20, 21, 23, 30, 40, 50, 62 years previously.....	8	0	0
Vaccinated in incubation period i.e., came down with smallpox and a taking vaccination	5	0	0
Total	34	15	45%
DETROIT	Cases	Deaths	% Mortality
Never successfully vaccinated	2	2	100%
AMHERSTBURG AND VICINITY	Cases	Deaths	% Mortality
Never Successfully vaccinated	11	10	90
Vaccinated years before—20 years, 40 years, 50 years, 60 years	5	0	0
Vaccination in incubation period	1	0	0
	17	10	90%
MAIDSTONE AND VICINITY	Cases	Deaths	% Mortality
Never successfully vaccinated	5	5	100%
Vaccinated years before, number of years unknown	2	0	
Taking vaccination and smallpox	3	0	
Total unvaccinated	39	32	82%
Total vaccinated or taking vaccination.....	24	0	0

These figures show the high mortality rate among the unvaccinated and how previous vaccination or a taking vaccination modified the course of the disease.

The above figures, however, do not show the following facts, although they are perhaps as striking in connection with the value of vaccination:

(1) No person who had been vaccinated at any time in his life or who had a taking vaccination was at any time seriously or dangerously ill. All these cases were very mild in character.

(2) The haemorrhagic cases (all of which were in unvaccinated individuals) all died and comprised about 60% of the total deaths.

(3) All unvaccinated cases who had the disease and recovered ran a very severe course and the majority were so ill that their recovery was not expected.

SPECIFIC INSTANCES OF THE VALUE OF VACCINATION

A man aged 75 and his wife aged 70. Man vaccinated 60 years pre-

viously—very mild attack, perhaps fifty pocks all told. His wife never vaccinated developed haemorrhagic smallpox and died.

In the house where the original case developed, the man's wife and sister, both unvaccinated, took haemorrhagic smallpox and died. This man's daughter of 11, vaccinated 5 years previously on entering school, did not take the disease, although exposed almost as much as the other two.

Three cases in Amherstburg—a man and his wife and the father, an old man of 80. The man and his wife never vaccinated, both took severe confluent smallpox and died—the old man vaccinated 62 years previously had an extremely mild attack and was practically never sick after the first three days.

Another case—the twin brother of the original case, never vaccinated, took smallpox of a severe confluent type and died. His wife vaccinated 40 years previously had an extremely mild attack and recovered. The children in this family all vaccinated within ten years did not take the disease.

There are other cases just as striking but these will serve as examples.

IS IT POSSIBLE FOR VACCINATED INDIVIDUALS TO DEVELOP SMALLPOX AND SHOW NO RASH?

There were two or three examples during the epidemic of individuals protected by vaccination having grippe-like symptoms about one week after exposure to smallpox and yet showing no rash. In two cases it appeared that these individuals either acted as mechanical carriers or had a very mild attack of smallpox with no rash, and transmitted the disease to others.

VALUE OF EFFICIENT AND WELL ORGANIZED HEALTH DEPARTMENT

In connection with the handling of the epidemic too much praise cannot be given to Dr. Fred Adams, M.O.H., the Medical Health Officers of the other municipalities affected, the local boards of health and the public generally.

The fact that perhaps 90% of the population of the Border Cities was vaccinated in ten days, speaks volumes for the energy of the local health department and the good sense of the public. The severity of the epidemic undoubtedly also assisted in the general vaccination which was carried out on a purely voluntary basis and was made possible by the whole hearted co-operation of the local medical men and of the Connaught Laboratories, Toronto.

DIAGNOSIS OF FIRST CASE

With regard to the undiagnosed first case, I may say that the best medical men in Windsor, including the local health officer, had excluded

smallpox owing to the irregular type of the case and its similarity to purpura haemorrhagica. In connection with other cases I may say that I myself saw two of the cases of haemorrhagic smallpox, one of which I thought was scarlet fever and the other of which, previously operated upon for appendicitis, I considered to be measles.

No chances, however, were taken and both cases were isolated and twenty-four hours later were diagnosed as haemorrhagic smallpox. Both of these cases died within three days of the first symptoms. When the cases could not be diagnosed in the face of the fact that there was an epidemic of malignant smallpox in the district, it is not surprising to me that the first case was not recognized.

PRESENT SITUATION

The Border Cities now have perhaps the best vaccinated population in Ontario; there have been no new cases of smallpox since March 9th, and the epidemic may be considered stamped out—"like turning off a tap" as the M.O.H. says. The need of an isolation hospital for Windsor has been clearly shown and I believe there will be one there within a year.

The epidemic then has its bright side although it seems a pity that innocent lives must be sacrificed to convince the public that a health department must be supported in its just requests.

Social Background

NEIGHBORHOOD WORKERS' ASSOCIATION, TORONTO

Annual Report for Year ending April 30, 1924

FAMILY WORK DIVISION

Number of Families Dealt With During the Year

Families where case was continued from the previous year.....	2232
Families which were not known previously to the Secretaries.....	570
Families which had been known at some previous period and were again in difficulty	132

Total number of families on which continued work was done over
some period 2934
Instances of families not known before coming in for a brief service 1475
Instances of families known before coming in for a brief service..... 918
Some idea of the time spent may be inferred from the fact that this work
involved 46,406 phone calls, 12,445 office interviews, 10,876 visits, 2,576
letters.

Some 72 addresses were given.

Problems Presented in These Families

This year the *economic problems* have caused us the greatest anxiety, not only because of the serious immediate situation they create, but also, because so many other problems follow in their wake. Very few families have just one problem awaiting a solution and experience has shown that many social mishaps might have been avoided had the worker realized that something more than the supplying of the necessary bread and butter and shelter was necessary.

Physical and Mental Infirmities constitute the next largest group. Illness in its various forms was present in 1313 families, and mental illness or defect was diagnosed in 145 families and suspected in 120 more.

Desertion, Intemperance, Begging Tendency, Bad Housing, Malnutrition, Non-adjusted Immigrants, Domestic Infelicity, Juvenile Delinquency, and many more—all offer their quota, and make us long for the day when economic problems will not be so pressing and we will have time to more adequately study and tackle these other social ills.

HOW THEY ARE HELPED

1207 families had material assistance in some form either given or arranged by Neighborhood Workers' Association workers.

Notwithstanding the difficulties met in trying to secure work—

Temporary employment was secured for.....	121 families
Employment that should prove permanent for	90 families
Relief work, such as messages, sewing, etc., for.....	72 families
Business equipment was provided for.....	10 families
Work was offered and refused in.....	39 families

Physical or mental examination or treatment was arranged for 465 families.

Undernourished children in 127 families and many sick and convalescent children were supplied with a special milk diet. The Heather and Wimodausis Clubs accepted many of these cases on the recommendation of the Secretary.

Legal assistance through lawyer or court was given to 107 families. This does not include the search made for 30 deserting husbands where no court action was taken.

Institutional care, either temporary or permanent, was arranged for 76 families and 39 children were placed in boarding homes.

54 families were assisted in moving to better homes in the city.

35 families were deported or sent to the place on which they were a proper charge.

Recreational and cultural opportunities were arranged in 183 families by putting the families in touch with some club or special class. Instruction in household economics was given in 7 families. This service might be greatly expanded if the right volunteers could be found to give the instruction.

The church was asked to visit 196 families who had no definite church connection.

The connection with relatives was strengthened in 72 families.

Our sister agencies in England, U.S.A. and Canada asked us to help them with 322 family problems—230 required an investigation in Toronto and 92 were in adjoining towns and have agreed to find a correspondent who will make the necessary investigation for us.

Very many families are given some personal service which it is almost impossible to classify. Some families coming to us are known to some other social agency or the agency is willing to assume responsibility and the Neighborhood Workers' Association in these cases acts simply as a clearing house. For many other families the Neighborhood Workers' Association staff must largely carry the responsibility receiving the co-operation of the appropriate church or specialized agency.

CHRISTMAS EXCHANGE

NEIGHBORHOOD WORKERS' ASSOCIATION, TORONTO

Report for Year ending April 30, 1924

Christmas is a time of abundant good will; a time of overflowing good fellowship. The Christmas Exchange provides the necessary vehicle through which that spirit can express itself sanely and helpfully. It receives and checks the lists of names sent in by organizations, giving baskets to needy families, and also secures a basket for any families in need who are not taken care of by registering organizations.

There were 1,010 duplicates prevented by the Exchange.

There were 2,427 families registered by other organizations.

There were 1,580 dinners arranged for through the Exchange.

Total number registered in the Exchange, 4,007.

Of the 1,580 registered 350 were ex-soldiers' families.

Number of Catholic families, 188.

Number of Protestant families, 1,392.

4,007 registered with the Exchange by the various organizations of the City.

270 agencies co-operated in sending in their lists.

The Agencies were as follows:

Number of Churches	92
Business Men's Clubs and Fraternal Societies	8
Women's Club and Fraternal Societies	20
Business Firms	4
Social Agencies	36
Private Individuals	91
Schools	19

STAR SANTA CLAUS BOXES

At the request of the Star Christmas Fund the Exchange received all the applications for Christmas Boxes for needy children.

Number of cards ok'd	4,809 involving 15,043
Number of cards rejected	381 Boxes
Number of duplicates eliminated	406
Number of wrong addresses, moved too far out to visit, 65 plus 42	107

Total number of cards handled by the Neighborhood Workers' Association	5,703
Number of By Letter Cards	2,441
Visits to Homes	2,000

FRESH AIR EXCHANGE

NEIGHBORHOOD WORKERS' ASSOCIATION, TORONTO

Report for Year ending April 30, 1924

The Fresh Air Exchange is organized to prevent duplication in Fresh Air Work. It receives and checks the lists of all Fresh Air agencies, receives applications on behalf of mothers and children needing an outing, calls conferences of camp workers to discuss the standards of camp care. The Exchange works very closely with the Star Fresh Air Fund, which has done such a great work for the children of Toronto.

Total number of children and mothers registered in the Exchange by Fresh Air Agencies 7,228
 Duplications Prevented 319

25 camps co-operated with the Exchange in sending in lists.

The Exchange received applications on behalf of 4,996 mothers and children.

Of this number 2,068 were given a 12 day holiday in camps directly under the supervision of the Neighborhood Workers' Association. 309 were received by other camps at the request of the Exchange. Some were found to be duplicates or ineligible and there remained 1,255 for whom no holiday could be arranged through lack of camp accommodation.

It is impossible to speak too highly of the fine spirit of co-operation which exists among the leaders of the various camps. They work together in the most splendid way, for the good of the children of Toronto, and the Exchange would like to record its cordial and sincere thanks.

BOLTON CAMP

There are three distinct camps on the Bolton property, all under the Supervision of the Neighborhood Workers' Association. They received and cared for the following numbers:

	Mothers	Children	Total
Hastings Lodge	187	491	678
Howell Camp	213	758	971
Rotary Cabin—Boys' Camp		314	314
<i>In Addition to the Above</i>			
Sent to Alliston		21	21
Private Country Homes	2	82	84
	402	1,666	2,068

The British Association for the Advancement of Science

The British Association for the Advancement of Science, while resembling the American Association for the Advancement of Science, nevertheless differs from it in certain particulars, and a few notes on its organization may be of interest to Americans and Canadians.

OBJECTS

"The objects of the British Association for the Advancement of Science are:—To give a stronger impulse and a more systematic direction to scientific enquiry; to promote the intercourse of those who cultivate science in different parts of the British Empire with one another and with foreign Philosophers; to obtain more general attention for the objects of science and the removal of any disadvantages of a public kind which impede it's progress."

ANNUAL MEETINGS

The Association, which was founded in 1831, meets annually for one week or longer at important centres, other than London, in England, and it occasionally meets in other parts of the British Empire.

The Association has met in Canada on three previous occasions, viz., in 1884, 1897 and 1909. Other overseas meetings have been held once each in South Africa, 1905, and Australia, 1914.

The average attendance at annual meetings of the Association for the 83 years previous to 1920 was 2330.

A proportion of the attendance consists always of residents in the locality where the meeting is held, but the large proportion are visitors. The Toronto meeting affords an exceptional opportunity for intercourse between British, Canadian, American and European workers in Science.

A preliminary programme will be forwarded on application to the Local Secretary, British Association, Physics Building, University, Toronto, and those who intend to be present at the meeting are particularly requested to apply for this as soon as possible.

MEMBERSHIP

No technical qualification is required on the part of an applicant for admission as a Member of the Association nor is there any limitation in respect of nationality.

The form of membership of most interest to Americans and Canadians, who are very cordially invited to join for 1924, is that of Annual Member.

Payment of \$7.50 made before or at the Meeting entitles the Annual Member to attend the meeting and to receive the report. Payment of \$5.00 entitles the member to attend the Annual Meeting and the Membership ticket admits the holder to any of the sectional meetings and to the various popular lectures, receptions, local excursions, etc., which are features of the meeting.

Membership tickets for the Meeting may be obtained from the local Hon. Treasurer, British Association, Room 50, Physics Building, University, Toronto; cheques should be made payable to the British Association for the Advancement of Science.

Arrangements are being made with the Railway Companies for reduced rates on the return fares of those who hold membership cards.

Hotel accommodation should be reserved in advance of the date of the meeting.

SCIENTIFIC MEETINGS

The Inaugural General Meeting will be held on Wednesday, August 6th, when Major-General Sir David Bruce, K.C.B., F.R.S., will assume the Presidency of the Association in succession to Professor Sir Ernest Rutherford, F.R.S., and will deliver the Presidential Address.

The Association is organized in thirteen sections designated as follows:—

President for 1924.

A.—Mathematical and Physical Science.....	Sir Wm. Bragg, K.B.E., F.R.S.
B.—Chemistry.....	Sir Robert Robertson, K.B.E.
C.—Geology.....	Prof. W. W. Watts, F.R.S.
D.—Zoology.....	Prof. G. Elliot Smith, F.R.S.
E.—Geography.....	Prof. J. W. Gregory, F.R.S.
F.—Economic Science and Statistics.....	Sir William Ashley
G.—Engineering.....	Prof. G. W. O. Howe
H.—Anthropology.....	Dr. F. C. S. Shrubbsall
I.—Physiology.....	Dr. H. H. Dale, C.B.E., F.R.S.
J.—Psychology.....	Prof. W. McDougall, F.R.S.
K.—Botany.....	Prof. V. H. Blackman, F.R.S.
L.—Educational Science.....	Principal Ernest Barker
M.—Agriculture.....	Sir John Russell, F.R.S.

Addresses will be delivered by the Sectional Presidents of the respective sections and papers will be read on and after Thursday, August 7th, until the conclusion of the meeting.

Joint meetings of various sections will be held also at which the following are among the subjects to be discussed.

Section	Subject
A and B—	Crystal Structure and Colloid Solutions.
A and G—	Optical Study of Elasticity.
B and I—	Vitamines and the relation of light to their action.
B and G—	Liquid and powdered Fuels.
C and E—	Changes of Sea-level in relation to Gravitation, Continental Shelves and Coral Islands.
I and J—	Physiological and Psychological Factors of Muscular Efficiency in Industry.
D and K—	Species Concept.
D and M—	Soil Population.
J and L—	Tests for Scholarship and Promotion.
F and M—	Diminishing Returns in Agriculture.
H and J—	Racial Mental Differences.

During the week of the meetings a number of popular lectures will be delivered by prominent visitors. Among the titles which have been announced are :—

"Human Heredity and National (or Racial) Outlook," by Professor W. MacDougall, M.B., F.R.S.

"Seeing is Believing," by Professor E. P. Cathcart, M.D., F.R.S.

"Work in the Himalayas," by Professor J. W. Gregory, D.Sc., F.R.S.

"Voice Production," by Sir Richard Paget.

"Disintegration of Atoms," by Sir E. Rutherford, F.R.S.

"The Importance of the Infinitely Small in Nutrition," by Professor J. C. Drummond, D.Sc.

A lecture to the Workers' Educational Association will be delivered by Professor R. H. Tawney of Oxford University.

The subject of the Presidential Address by Sir David Bruce will be "Advances made in our knowledge of disease (with special reference to methods developed during the war)".

Additional information will be gladly supplied by the Local Secretary, British Association, Room 50, Physics Building, University, Toronto, Canada.

The meeting of the Physiology Section will commence on Thursday, August 7th, at 10 a.m., with the address of the President, Dr. H. H. Dale, F.R.S., Director of the Biochemistry and Pharmacology Department of the Medical Research Council of Great Britain. This will be followed by papers from Profs. A. B. Macallum, H. E. Roaf, W. B. Cannon and A. Querido.

Afternoon—Among subjects to be presented are "Studies in Visceral Reflexes"; "On the Tactile Sensory Reflex"; and "Fractionate Contractions in Premature Ventricular Systoles in Mammalian Hearts". At 5 o'clock Professor J. C. Drummond will present a popular lecture on "The Importance of the Infinitely Small in Nutrition".

Friday, August 8th, Forenoon—A joint discussion with the Psychology section on "Physiological and Psychological Factors of Muscular Efficiency in Industry." Among the eminent contributors being Profs. C. Lovatt Evans, B. A. Bott, E. P. Cathcart, C. S. Myers, and F. S. Lee.

The afternoon is reserved for demonstrations.

Monday, August 11th, Forenoon—A joint discussion with the chemistry section, "Vitamines and the Relation of Light to their Action." Among those taking part are Profs. J. C. Drummond, H. C. Sherman, Sir Henry Gauvain, E. Mellanby, W. H. Eddy, W. Lash Millar.

Afternoon—Prof. E. P. Cathcart, F.R.S., will speak on "The Respiratory Quotient". This will be followed by six other papers on various important subjects.

Tuesday, August 12th, Forenoon—Three papers on the most recent work on Insulin. Among the other subjects to be dealt with may be mentioned "The Effect of Absorbable Intestinal Toxins on Metabolism".

Afternoon—Prof. Robert Kennedy, Glasgow, will speak on "The Present Position of Anastomosis of Nerves", and Prof. G. H. Parker, "On the Carbon Dioxide Production of Nerve".

Among other contributors are Profs. P. A. Shaffer, L. B. Mendel, T. B. Osborne and D. D. Van Slyke.

Various papers in the Psychology section will be of interest because of their bearing on Psychotherapy.



The Provincial Board of Health of Ontario

Communicable Diseases reported for the Province for the Month of
May, 1924

COMPARATIVE TABLE

Diseases	May 1924		May 1923	
	Cases	Deaths	Cases	Deaths
Cerebro-Spinal-Meningitis	9	8	9	8
Chancroid	5	....	6	....
Chicken Pox	350	....	*....	....
Diphtheria	270	26	165	14
Encephalitis Lethargica	3	3	*....	....
Gonorrhoea	75	....	209	....
Influenza .....	....	14	....	47
German Measles	171	....	*....	....
Measles	4577	13	2359	14
Mumps	978	2	*....	....
Pneumonia .....	....	188	....	250
Scarlet Fever	659	8	397	7
Septic Sore Throat	5	1	*....	....
Small-Pox	32	2	17	....
Syphilis	115	....	99	....
Tuberculosis	317	105	221	118
Typhoid	56	2	89	24
Whooping Cough	141	4	142	16
Goitre	2	1	*....	....

*Not reported in 1923.

THE FOLLOWING PLACES REPORTED SMALL-POX

Brantford 1 case Ottawa 10 cases 1 death, Chatham 7 cases,
Elizabethtown 4 cases, Brockville 3 cases, Westminster 1 case, Chappel
1 case, Sudbury 1 death, Galt 1 case, Elmira 1 case, Humberstone V. 1
case, Port Colborne 1 case.

JOHN W. S. McCULLOUGH.

SMALL-POX IN THE PROVINCE OF ONTARIO
1913—1923

	Cases	xDeaths
1913	744	2
1914	511	1
1915	626	2
1916	174	5
1917	225	1
1918	435	2
1919	3046	5
1920	5169	33
1921	3777	24
1922	977	6
1923	335	....
	<hr/>	<hr/>
	16019	81

xFrom Registrar General's Reports.

SMALL-POX IN THE PROVINCE OF ONTARIO
FIRST 5 MONTHS, 1924

	Cases	Deaths
1924	422	47

The Sanitary Inspectors' Association of Canada

THE TRIANGLE OF INSPECTION

By MR. C. C. THOM, B.S.A., M.S.

*Chemist and Bacteriologist to the Union Milk Company Limited,
Calgary, Alberta*

Read before the Annual Convention, Calgary, Alberta

THE fact that we have inspection justifies the assumption that there is something or somebody to be inspected, that there is a demand on the part of the public for such inspection and further that there is a properly constituted authority clothed with power to act. This authority may be vested in one person or a group of persons as the case demands. In any case such authority is so vested by virtue of enactments either federal, provincial or municipal, and as such should be taken as a mandate from the people for the common good.

The authority behind the inspector is, frequently, his greatest difficulty. Legislative bodies in framing and passing regulations very often do so without an adequate knowledge of the problem under consideration. It should be the primary duty of all those with power to enact such regulations to ascertain, first, the real necessity for regulation and second, to so phrase or frame that regulation, that, while it regulates, it may also be executed without undue disorganization of existing procedure. Regulations passed without due consideration are often quite inadequate and frequently, either in whole or in part, utterly impossible of execution. Quite often also legislative bodies are led to act on the insistent demand of an over-zealous few; to later find that no real necessity for such regulation existed. This is undoubtedly one of the greatest dangers of the day. The present tendency on the part of the public, to form associations, societies, groups and what not, each with a demand for this or that is a most insidious procedure and one that demands the closest scrutiny of our legislators. Regulations must be simple to be applicable. If our legislators and lawyers would give greater consideration to the style and brevity of the ten commandments our task would be easier and our regulations more effective.

It is a further and equally important duty of our legislators after having passed effective legislation to see that the officer placed in charge of administration is competent, active and possessed of those qualities of tact and good judgement so necessary in an effective administrative officer. All too frequently an administrative officer has received his appointment not because of any special aptness or fitness for the work but because the exigencies of the political or social situation demanded that he be given first consideration. No amount of adroitness, evasiveness or

political side-stepping on the part of an officer so appointed will ever prevail against his incompetency and sooner or later his administration will result in failure with all that it entails in lack of confidence in and disrespect for, constituted authority.

No administration will ever attain a full measure of success without a definite and progressive policy to work upon. A hand to mouth or day by day administration is one of the greatest inducements to careless and indifferent work on the part of all subordinates attached to such an office. Aside from being competent and progressive an administrative officer must be active and his activity must not arise from any ulterior motive or political ambition but from a genuine desire to give real service to the community. A competent progressive and active officer imbues his associates with the same spirit and is a constant incentive to greater effort and better service on the part of his staff.

Generally speaking those persons whose activities are to be regulated fall readily into four classes: the efficient, the ignorant, the careless or indifferent, and those who deliberately attempt to defraud or mislead. The efficient must be complimented and made to feel that their efforts merit our highest commendation. The ignorant are of two kinds, those that admit it and those that will not. Those who admit their ignorance can and should be educated, for in so doing a distinct benefit will be conferred upon the individual and through that individual upon the community. Those who are ignorant and will not admit it are as a rule most hopeless and while they may have our sympathy they do not merit our consideration and must be made to conform to all requirements. If they will not conform they must be made to feel the error of their judgement even to the extent of being forced to cease their operations entirely. The careless and indifferent are very similar to the ignorant who will not admit it and like them must be made to feel their full responsibility. Those who defraud or mislead are a distinct menace to the community and must be promptly and effectively dealt with. They have destroyed all claim to consideration and must receive full punishment under the law. If they are not punished their example or method of procedure will, in time, be followed by others with a consequent retrogression in business and social ethics, a condition that soon reflects upon the health and morals of the community which they serve or of which they are a part.

The public by and at large is quite in favour of and in sympathy with adequate inspection and regulation, if for no other reason than that we have learned that it is a matter of good business. Individually we are not quite so broad in our view point. We are too prone to agree that it is quite proper for an executive officer to restrict our neighbour's liberties

and too ready to condemn him as an over zealous official when he endeavours to restrict our own in similar circumstances. While the public is in favour of regulation it frequently fails to show a just appreciation of the good that has been accomplished. Many a zealous and efficient public worker, after having struggled along for years, has thrown up his hands in disgust and discouragement because of this lack of appreciation. It is no encouragement to a public worker to see a thousand dollars voted for a street carnival while he cannot get two cents towards improving the public water or milk supply. The lack of appreciation by the public for public service well rendered is a well recognized fact and constitutes the basis of refusal by many persons well fitted for such work.

The inspector who undertakes to regulate these three points of rather delicate contact must indeed be possessed of extraordinary if not super-human qualities. He must give heed to the policy of the administrative office of which he is a member. Loyalty is his first requisite. However competent a man may be if he is not loyal to the trust reposed in him his usefulness is at an end. For this reason he should refrain from criticizing the words and actions of his superiors for it is not always wise nor necessary, for the time being at least, that he be fully informed as to the necessity for such words or actions. We do not mean by this that he should accede to that which he knows to be wrong for in so doing he would be just as disloyal to his trust as if he knowingly did wrong himself. In addition to his loyalty he must be both competent and tactful. He must be competent to gain the confidence of those whose actions he endeavours to regulate and tactful to retain their good will. Incompetency is quickly recognized by those whose actions it is his duty to inspect and regulate and once it is recognized confidence is gone. Arrogance on the part of an inspector, or the assumption of a Kaiser-like divine right to inspect everything and everybody but himself will never gain the respect and good will of his community. He should avoid those qualities which in a quarantine officer would lead the public to regard him as worse than the disease he quarantines. He must undertake the work for the possibilities which it offers and not altogether for the remuneration it carries. The inspector who regulates his efficiency to the size of his pay check will never get much satisfaction from his results and will never be of any great value to his community.

The inspector's task is no sinecure; he seldom gets full credit for what he does, generally he is under rather than over paid; he is the recipient of much abuse and little praise and yet in spite of all this it should be his constant endeavour to bring about a permanent improvement in standards, quality, health and sanitation. In this effort he has the full measure of our sympathy.

Notes on Current Literature

From the Health Information Service, Canadian Red Cross Society,
410 Sherbourne St., Toronto

Child Labour Laws in Canada.

A comparative study of the child labour laws of Canada. Copies of this may be obtained from the Canadian Council on Child Welfare, Box 753, Ottawa, Ontario.

Care of Expectant Mothers.

"The Expectant Mother in the House of Health" is a new handbook issued by the American Child Health Association. Copies may be obtained from 370 Seventh Avenue, New York City. Price 10 cents.

Diabetes and Insulin.

By Elliott P. Joslin, M.D., Boston, Mass. "Monthly Bulletin", Health Department, City of Boston, April, 1924, page 85.

A Study of the Incidence, Mortality and Fatality of Diphtheria.

By W. J. V. Deacon, M.D., of the Michigan State Department of Health. "American Journal of Public Health", May, 1924, page 404.

The Control of Diphtheria.

Recent advances in the control of diphtheria. By Professor R. H. Mullin, University of British Columbia. "Canadian Medical Association Journal", May, 1924, page 398.

Heart Disease as a Public Health Problem.

By Haven Emerson, M.D., President of the New York Association for the Prevention and Relief of Heart Disease. "The Public Health Nurse", May, 1924, page 245.

Tuberculosis in Children.

By A. H. Parkinson, M.D., B.Sc., D.P.H. "The Medical Officer", April 26th, 1924, page 179.

Home Care in Tuberculosis.

An address before the Iowa Tuberculosis Association on the care of the tuberculosis patient in the home. "The Public Health Nurse", April, 1924, page 203.

Maternal Care.

The Maternity Centre Association of New York City has issued a booklet giving the routines for the nurse's supervision of a mother during pregnancy, assistance at confinement and care after birth. The booklet also contains an outline of eight talks to mothers' clubs.

Disease in Early Infancy.

The Intra-Natal Causes of Neo-Natal Death of the Infant. By Eardley Holland, M.D., F.R.C.S. "National Health", May, 1924, page 340.

School Medical Inspection.

By C. V. Akin, Surgeon, U.S. Public Health Service, Hagerton, Md. "The Nation's Health", December 15th, 1923, page 864.

Nutrition in School Programme.

The place of nutrition in the school programme. An address by Lou Lombard, Instructor in Nutrition of the Massachusetts Department of Public Health. "American Journal of Public Health", May, 1924, page 394.

Mental Hygiene in Manitoba.

The progress of mental hygiene in Manitoba. By W. M. Musgrove, M.D., Assistant Director, Psychopathic Hospital, Winnipeg. "The Canadian Medical Association Journal", May, 1924, page 377.

Public Health Nursing.

Opportunities and responsibilities for lay persons in public health nursing work. By Gertrude Peabody, President, Massachusetts Association of Directors of Public Health Nursing Organizations. "The Public Health Nurse", May, 1924, page 229.

Morphinism.

The Department of Health of Canada has reprinted for the use of medical practitioners a report on morphinism by Dr. C. E. Sandos, Medical Director, Boston Municipal Court.

Social Service.

The Russell Sage Foundation has issued a new edition of the pamphlet by Margaret F. Byington, entitled "What Social Workers should Know about their Own Communities".

Canadian Tuberculosis Association Leaflet.

A new leaflet giving health hints for children. Supplies for further distribution may be obtained from the Secretary, Canadian Tuberculosis Association, Bank Street Chambers, Ottawa.

Victorian Order of Nurses.

The report of the Victorian Order of Nurses for Canada for the year 1923. Copies of this report may be obtained from 109 Sparks Street, Ottawa.

Red Cross Supplies.

The Ontario Division of the Canadian Red Cross Society has issued a pamphlet giving official instructions for making, packing and shipping

supplies needed in carrying out the peace-time programme. Copies of this pamphlet may be obtained upon application to the Ontario Division, Canadian Red Cross Society, 410 Sherbourne Street, Toronto.

Saskatchewan Nursing Housekeepers.

An outline of the one-year course of study for the Saskatchewan Nursing Housekeeper, instituted by the University of Saskatchewan in co-operation with the Provincial Red Cross and the Saskatchewan Registered Nurses' Association.

Report of National Headquarters—Canadian Red Cross.

Annual report of the Executive Committee and Review of Activities of Provincial Divisions for the year 1923.

REPORTS OF PROVINCIAL DIVISIONS

Canadian Red Cross Society

The following Provincial Divisions have recently issued reports on their work during 1923. Copies may be obtained on application to the Divisional Office :—

Ontario—410 Sherbourne Street, Toronto, Ontario.

Manitoba—187 Kennedy Street, Winnipeg, Man.

Nova Scotia—63 Metropole Building, Halifax, N.S.

Quebec—45 Belmont Park, Montreal, Que.

Correspondence

The Editor,
The Public Health Journal,

Dear Sir:

I have read with very great pleasure, your article, in the Canadian Public Health Journal for April, "The Teacher as a School Physical Inspector". This is a subject in which I have taken considerable interest for several years past, having on more than one occasion emphasized the part the teacher should take in the physical as well as the mental development of children.

It affords me pleasure to quote as follows, from my Annual Report for 1906-1907:

"Perhaps it may not be out of place here to say that we had a very efficient staff of inspectors in Hamilton long before Medical Inspection was mooted a few months ago, and that the work of the principals and teachers themselves, especially in eliminating contagious and infectious disease from the schools has been most commendable. They have at all times properly referred all suspicious cases to our department, are always on the lookout to ascertain why pupils are absent from school, and have been most particular in seeing that children are not allowed back in class from homes where contagion has existed without the proper certificate from the health officer. The school nurse who is to begin her duties at the first of the year will no doubt be of signal service particularly in this capacity."

I would also mention a paper I read before the Ontario Education Association in 1909, entitled "The Relation of Teacher and Nurse to Medical Inspection".

"The community undertakes a very serious responsibility when it masses together large numbers of children at the time in their lives most susceptible to nearly all the communicable diseases and should take every possible precaution to minimize the dangers incurred by such aggregation. To attempt the realization of this by utilizing the daily or even less frequent visits of a medical practitioner would, in my opinion, be wasteful, not to speak of the disorganization produced as an additional and probable result. As practical men and women, we have to make our ideals reasonable and feasible, subjected, as they inevitably must be, to the diversified and multiform influence, actuating and dominating the

minds of the men to whom we look for their adoption. Regard must be had for considerations of economy, and where the services of a nurse or teacher are sufficient there is no justification for the employment of a doctor."

These quotations are some of the evidence of the great importance I attach to the subject, and it is gratifying to me to note you are directing public attention thereto through the medium of the Canadian Public Health Journal.

I have the honour to be, Sir,

Your obedient servant,

JAMES ROBERTS,

Medical Officer of Health,

Hamilton, Ont.

News Notes

INTERNATIONAL COURSES IN NURSING

The fifth International Course in Public Health Nursing, conducted by the League of Red Cross Societies, will open at Bedford College of Women, University of London, England, on September 1st, 1924.

Owing to the fact that many requests for information regarding the best methods for securing advanced instruction for directors and teachers of schools for nurses, have been received by the League, it has been decided to arrange a second International course in London for the purpose of giving special instruction to nurses from different countries who wish especially to include public health nursing in the curricula of schools for nurses.

This second course will be held at the same time as the Public Health Nursing Course and some of the theoretical part of the two courses, which will be given at Bedford College for Women, will be identical, but additional lectures will be arranged and the practical and observation work of the two courses will be entirely different. The new course will be entitled "The International Course for the Training of Nurse Administrators and Teachers in Schools of Nursing."

Further information in regard to these courses will be furnished by the Canadian Red Cross Society, 410 Sherbourne Street, Toronto.

The Canadian Council on Child Welfare hold their Annual Meeting at the Gage Institute, Toronto, June 23rd and 24th. Topics of discussion will include Child Health with discussions on Pre-natal letters and Little Mothers' League. The Child in Employment, Education and Recreation. The Child in need of special care. The religious and spiritual Development of the Child. Professor C. D. MacPhee of the University of Alberta will introduce the discussion of "A Five Year Programme in Child Welfare". Mrs. Sidney Small of Toronto will describe the Council's programme for 1924-25. Hon. Dr. W. F. Roberts, Minister of Health for New Brunswick and Judge D. B. Harkness of Winnipeg will be the speakers at the final Session in the evening of Tuesday, June 24th.

The new President of the Ontario Medical Association is Dr. George S. Young of Toronto.

The combined meeting of the Canadian and Ontario Medical Associations held in Ottawa during the week of June 16th was a decided success. Registration was heavy and the presence of various distinguished guests, including Sir Jenner Verral, Chairman of the general council of the British Medical Association and Dr. Alfred Cox, General Secretary of the British Medical Association, added distinction to the occasion and augurs well for the closer relationship between the British and Canadian Associations in the future. Radio talks on health were delivered by prominent delegates. An unique and interesting feature was an address by Dr. Hutton of Chicago before the Round Table on publicity methods.

The Canadian Medical Association at its Annual Meeting passed a strong resolution endorsing the Dominion Government programme for the control of Venereal Diseases and urging that the Government continue government grants to the provinces as in the past without reduction.

The National Conference of Social Work to be held in Toronto from June 25th to July 2nd has a programme which is full of features. The Conference besides its general sessions will have section meetings on Children, Delinquents and Correction, Health, The Family Industrial Economic Problems, Neighbourhood and Community Life, Mental Hygiene, Public Officials and Administration. Many authorities prominent in varied fields of Health and Social activities are expected to attend and read papers. Copies of the full programme are available on application to the PUBLIC HEALTH JOURNAL.

Social Hygiene will be fully discussed during the National Conference on Social Work. A regular Section meeting will be held on Tuesday, July 1st at 11 a.m., at which the speakers will be: Dr. Gordon Bates, Toronto; Dr. Max Exener, American Social Hygiene Association, New York; Dr. F. R. Dixon of Detroit, and E. F. VanBuskirk of Cincinnati. On Friday, June 27th, a special luncheon for workers in the field of Venereal Disease Control will be held in the King Edward Hotel. Speakers on this occasion will include: Ray H. Everett, New York; Mrs. Maida C. Solomon, Boston, Mass.; Mr. John Gebhart, New York; Dr. W. F. Snow, New York; Jane Cook, Orange, N.J.; Bernard C. Roloff, Chicago, Ill.; Dr. Gordon Bates, Toronto, Ont.; a representative of the Dominion Health Department, Ottawa; a representative of the United States Public Health Service, Washington, D.C.; Miss Evelyn G. Chase, Nashville, Tenn.

A Social Hygiene Exhibit has been prepared by the Canadian Social Hygiene Council and will be on view in the gymnasium of Knox College during the Conference and it is also expected that a special educational demonstration along Social Hygiene lines will be staged in one of the down-town theatres.

Book Review

A Synoptic Chart of Skin Diseases, by B. Burnett Ham, M.D., D.P.H., Royal Victoria Hospital, Netley, bound in cloth, Price \$4.00. The Macmillan Company of Canada.

This volume includes a series of large, coloured illustrations on cardboard, demonstrating the sites and characteristics of all ordinary skin diseases. The scope of the work as stated in the preface includes all the more common diseases of the skin, with the hope that the present edition may prove useful alike to medical officers of health and students of dermatology. The aim of the present chart has been to portray a characteristic part of an eruption in a characteristic situation, as far as can be done by a single representation. It must be clearly understood, however, that such lesions, like the majority of skin eruptions, may and do occur in other parts of the body than those illustrated in the Chart.

The illustrations with the added descriptive matter which is carefully arranged in chart form so as to be readily accessible, together form a very valuable and ready means of reference.

G.A.B.

Editorial

UNITED WE STAND

There are always many difficulties in the way of progress in the development of preventive measures in the field of health. Only recently have we come to understand the general principles underlying the spread of disease. Specific information on the matter has for a long time been in the hands of specialists and has therefore a very limited application. It is only after years of experiment and practical application of diagnostic and preventive methods that knowledge becomes widespread enough to justify the expenditure of public funds through avenues which are so new and strange that legislators cannot at first understand them.

The field of curative medicine is different. The maimed, the halt and the blind have an immediate appeal to the sentiment of the most hardened and the practical business man will readily go down into his pocket for the relief of obvious and heart-rending suffering. The building of a hospital or sanitarium or the purchase of an expensive X-ray apparatus are tasks of perfectly obvious necessity which appeal to anyone and men with money have given enormous sums for these and analagous purposes. Governments have readily made necessary expenditures for similar reasons.

Preventive work such as is undertaken by the National voluntary agencies is much more difficult and requires considerable study. The results in that they often depend on experiment are frequently problematic instead of certain and it would appear that the appeal is much weaker. There is no doubt that thorough investigation will generally prove that the reason for the existence of such organizations is rational and sane but investigation takes time in a busy life. Meanwhile in spite of some progress typhoid still kills, diphtheria still claims its thousands, tuberculosis still exacts a heavy toll, syphilis subtle but not less sure plays its sinister role and disability and death comes unnecessarily. Such fields as Child Welfare, Social Hygiene and Mental Hygiene grow slowly and many fundamental activities, the need for which has been proven to the hilt, are neglected by individual and governments alike.

It would seem that in view of the more or less precarious existence which must be the lot of many voluntary organizations under present conditions and the comparatively slow progress made under governments some further effort should be made to co-ordinate existing

activities in the Dominion both voluntary and governmental. At present where there is a retrograde movement in any field, evidenced by slowing up either on the part of a government or a voluntary organization it is difficult to organize effective action. Health forces do not present a united front and the result is anything but satisfactory.

The United States seems to have made definite progress in the formation of its National Health Council. The principle involved here might well be applied in any country. Some such form of organization is certainly necessary in Canada and it is hoped that the many organizations and individuals who have come to realize the importance of organized efforts for health conservation during the last few years will realize that in unity lies strength and that only through unified efforts will public health in this or any other country make the rapid progress which it should.
